

SUPERFUND PRELIMINARY SITE CLOSE OUT REPORT

Zschiegner Refining Company Superfund Site
(NJD986643153)

Howell Township, Monmouth County, New Jersey



Prepared by:
U.S. Environmental Protection Agency
Region II
New York, New York

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I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has determined that all construction activities at the Zschiegner Superfund Site (Site) have been completed in accordance with EPA's *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P, January 2000). One Record of Decision (ROD) has been signed for the Site.

All work has been performed in accordance with the ROD and Remedial Design prepared for the Site, with oversight by EPA and the U.S. Army Corps of Engineers (USACE). The New Jersey Department of Environmental Protection (NJDEP) has concurred with all activities conducted at the Site. A final inspection and walkthrough was completed on July 18, 2008.

II. SUMMARY OF SITE CONDITIONS

Background

The 6.1-acre Site is located in a rural residential area. The Haystack Brook and its associated wetlands run southward on the eastern portion of the property and a tributary to the brook runs along the southern portion of the property. A single-story operations building was present on the southwestern portion of the property and a collapsed cesspool was between the building and Haystack Brook. Two homes border the Site; the closest house is within 50 yards of the former on-site building.

The Zschiegner Refining Company operated from 1964 to 1992 as a precious metals recovery facility. On-site operations included the chemical stripping of precious metals from watch bands, film, and electrical components. In October 1992, the Federal Drug Enforcement Administration raided the facility based on suspicions of illegal drug manufacturing. Approximately 3,000 different chemicals (including peroxide, cyanide, caustics, and acids) were found improperly stored throughout the Site.

Initial removal actions were performed between November 1992 and November 1995. These included the disposal of approximately 2,000 gallons of acidic solutions, 1,600 gallons of basic solutions, and 1,400 small containers of hazardous waste. Discharge areas from the on-site building were located during initial reconnaissance activities. High levels of chromium were reported from initial sampling and indicated a potential risk to human health and the environment at the Site. The Site was proposed to the National Priorities List (NPL) in September 1997 (62 FR 50450) and finalized on the NPL in March 1998 (63 FR 11332). The EPA Site Identification Number is NJD986643153.

On September 30, 1998, EPA initiated a remedial investigation to determine the nature and extent of contamination. Field work for the remedial investigation began in September 2000, and additional ecological investigations were conducted in 2003. A feasibility study, which evaluated different remedial alternatives for the site, was completed in 2004, and final remedy for the entire Site was selected in a ROD signed on September 2004.

The on-site building was demolished and removed from the Site in 2007 by the EPA removal branch as a part of preparation for the remedial action.

Remedial Action Objectives

The following remedial action objectives (RAOs) were identified in the ROD to address the potential risks associated with the Site.

Soil

The RAOs for the contaminated soil at the Site are:

- Prevent or minimize potential future exposures of humans to contaminated surface soil;
- Prevent or minimize adverse ecological impacts from contaminated surface soil; and
- Prevent or minimize contamination in soil as a source of groundwater, surface water, and sediment contamination.

Sediment

The following RAOs for contaminated sediment, both in the wetland area and a small portion of Haystack Brook include:

- Prevent or minimize potential future human exposures to contaminated wetland sediment;
- Prevent or minimize adverse ecological impacts from contaminated wetland sediments;
- Preserve, to the extent possible, the approximately one-acre area adjacent to the site that is a potentially suitable habitat for bog turtles; and
- Prevent or minimize contamination in wetland sediments as a source of Haystack Brook sediment and surface water contamination.

Groundwater

The following RAOs for contaminated groundwater include:

- Restore contaminated groundwater for beneficial use;
- Prevent future human exposure including ingestion and dermal contact with contaminated groundwater; and
- Prevent or minimize contaminated groundwater from discharging into the wetland and Haystack Brook.

Table 1 lists the cleanup criteria for all media at the site.

Remedy Description

The Selected Remedy described in the 2004 ROD included the following major components:

- Excavation of an estimated 1,750 cubic yards of contaminated surface soil and 1,240 cubic yards of subsurface soil, sampling to verify the site cleanup criteria are met, backfill with clean fill, and restoration;
- Excavation of an estimated 4,500 cubic yards of contaminated sediment from the wetland and a small portion of the brook adjacent to the site, backfill, and restoration with monitoring for at least 5 years to assure the wetland is reestablished;

- Transportation of the contaminated soil and sediment off-site for disposal, with treatment if necessary;
- Demolition without replacement of the on-site building to allow for the excavation of the contaminated soil beneath it; and
- Monitoring of contaminated groundwater for a period of 3 years after removal of the contaminated subsurface soil to determine if contaminant levels are being sufficiently reduced by the source removal. If so, monitoring of ground and surface water would then continue for a period to be determined.

EPA believes that source removal effectively reduced the elevated levels of contamination in the shallow groundwater at the site, therefore an active groundwater remedy is not necessary.

Remedial Construction Activities

The USACE Philadelphia District (NAP) provided technical support to EPA for the remedial action (RA) at the Site. USACE contracted with Jacobs Engineering Group Inc. (Jacobs) to perform the site remediation under the Louisville Multiple Award Remediation Contract (MARC) W912QR-04-D-0026, Task Order No. CF01, issued by the USACE NAP. The Final Design was completed in December 2006 and amended on April 27, 2007. The Site was divided into four wetland areas and 12 upland areas for excavation, backfill, and restoration. An RA report approved September 2009 provides a detailed description of soil clean-up activities.

Site Preparation

After demolition of the on-site building in February 2007, site mobilization and preparation began in July 2007. The following preparatory tasks were conducted prior to the RA:

- Temporary dam construction and Haystack Brook diversion channel excavation;
- Tree and brush clearing in the uplands and wetlands;
- Transport road construction for access to the excavation area with timber mats, geotextile and stone;
- Construction of treatment and storage facilities for soil and water; and
- Construction of decontamination facilities for equipment and personal protective equipment (PPE) changing stations for site workers.

Construction of the backchannel for diversion of Haystack Brook involved first the excavation of a six-foot wide and 2.5-foot deep channel in the natural flood plain. Two diversion berms were then constructed upstream and downstream of the contaminated sediment area. Water turbidity was monitored in the diversion area and compared to the results from upstream and downstream. The water treatment system and drying beds were also constructed prior to excavation activities.

Pond Dewatering Activities

In preparation for excavation and backfill of a portion of the upland area (U8), the pond at the southern portion of the site had to be dewatered. This took place between April 2008 and June 2008. Pond water was processed through a series of filter bags and discharged into sediment filter bags downstream of the southernmost wetland excavation area. The water was tested and found not to be contaminated. Some of the water was also used for dust control and irrigation in

contaminated areas. Dewatering wells were used during excavation of upland areas U8, U7, and U3 in order to keep the groundwater below excavation depth.

During excavation of the upland area (U8), a naturally occurring six to twelve-inch layer of coarse sand and fine gravel was observed. Attempts to backfill this area were unsuccessful due to groundwater infiltration, so a corrective measure was implemented. The measure involved the installation of cement/aggregate non-fly ash flowable fill to a below-grade elevation, which provided a competent substrate for earthen embankment backfill and compaction. The flowable fill was poured over an anchor trench three feet wide by three feet deep.

Upland Areas

Excavation

Upland excavation began in October 2007 and was completed in July 2008. Three upland areas were begun at the start of work to create a necessary staging area. During excavation of one of the three initial upland areas, remains of a concrete structure were uncovered. This material was removed and disposed of with the soil.

Demolition material from the previously existing on-site building was stockpiled on site prior to excavation work. The material was analyzed for disposal and found to contain non-friable asbestos. Asbestos-containing material and soil were shipped to a proper disposal facility. Stained soil found beneath the former building footprint was analyzed, excavated and disposed of at an approved hazardous waste landfill.

The excavation of the nine remaining upland areas was completed after wetland excavation. Upland soil was found to be non-hazardous waste through historic data and RA waste characterization sampling. Post-excavation soil sampling in the upland area confirmed that remediation goals had been achieved in accordance with project cleanup objectives outlined in the 2004 ROD. Additional excavation was completed as necessary. A final footprint of 360 square feet (SF) was excavated from the upland area.

Backfilling and Restoration

All backfill material was tested prior to placement on the site. The upland area was first backfilled with common fill to six inches below grade. Backfilling and compaction took place directly after excavation. A total of 23,739 cubic yards (CY) of common fill was placed in excavation areas, including the wetland area. 432 CY of flowable fill were installed in the area around the pond. The backfill was covered with six inches of topsoil; 1,760 CY of this topsoil was used in the upland area. The footprint of the former building was lined with geotextile fabric and backfilled with stone before excavation during the second segment of upland excavation.

Restoration of the upland area commenced on July 2, 2008, with the placement topsoil over the compacted soil in all affected areas. The upland area was hydroseeded as required immediately after topsoil placement in July; however, germination of the seed appeared weak during monthly inspections, likely due to dry conditions. As such, upland plantings were deferred until October 2008 with the hope that establishment would be easier for these trees during the fall season. The upland area was re-seeded in October and more favorable germination was observed after the re-seeding event. More than 50 trees were planted in the upland area from October 13, 2008 to October 15, 2008.

Wetland Areas

Excavation

Wetland excavation began after the diversion of Haystack Brook was completed between November 2007 and April 2008. Haystack Brook was returned to its natural flow pattern on April 26, 2008. The excavation of wetland soils began in the northeast edge of the Site and proceeded southwest to prevent cross-contamination. After excavation, wetland sediment was transported to a sediment processing area, where sloped drying beds were created to allow the water to drain from the wet sediment and be collected. To aid in the drying of the sediment, it was mechanically turned on the drying bed and amended with cement kiln dust, as necessary.

A total of about 12,280 CY of wetland/stream sediment was excavated from the four wetland areas. The wetland/stream excavation covered an aerial extent of 72,366 SF. Due to characterization during the pre-design phase, no post excavation sampling was completed in the wetlands. Global Positioning System (GPS) and surveying was used to confirm excavation limits.

Wastewater generated during excavation activities was treated on-site. Treated water was tested for eventual discharge or disposal. Upgrades to the treatment system were required after initial results showed that discharge permit requirements were not being achieved. After failed attempts at treating generated wastewater, it was decided to dispose of excavation water off-site to a proper disposal facility. Off-site disposal allowed for continued excavation of the wetlands without delay due to discharge requirements.

Backfilling and Restoration

Backfill of the wetland areas occurred concurrently with the excavation activities. Clean sand fill was placed to one to two feet below restoration grade. Topsoil was then backfilled on top of the compacted sand. Common backfill material used throughout the Site totaled 23,739 CY. Topsoil used totaled 5,460 CY with 1,760 CY used in the wetland area.

Restoration of the wetland area commenced on April 29, 2008 and the initial round of plantings was completed on May 16, 2008. Restoration of Haystack Brook occurred immediately after excavation of the affected areas, on an ongoing basis. Enviroscapes, Inc. of Kendall Park, New Jersey performed the wetland restoration activities.

The wetland was divided into four zones – Inner Wetland Community (46,000 SF), Middle Wetland Community (22,800 SF), Outer Wetland Community (25,000 SF), and the Emergent Community (5,500 SF). More than 5,000 plantings, consisting of trees, shrubs, and ground-cover plants, were placed in the wetland area during restoration, and the entire area was seeded. Trees were provided by Clear Ridge Nursery in Union Bridge, Maryland and Forest View Nursery in Clayton, Delaware. All herbaceous material was provided by Pinelands Nursery in Columbus, New Jersey.

The banks of the brook were reconstructed using Coir Logs enhanced with live stakes and brush layering to encourage tree/shrub establishment. Erosion control blankets (coconut and coir matting) were installed over the newly placed soil on the stream bed to control sediment migration and improve stream water quality. Stream restoration overlapped with the completion of the upland area excavation.

After the final restoration activities were completed, temporary offices and utilities were demobilized. The site was then resurveyed on October 13, 2008.

Monitoring

Groundwater

Concurrent with wetland restoration, five shallow groundwater wells were installed in the wetland area. Another five monitoring wells were installed in the upland area concurrent with upland backfilling to replace the wells abandoned during site preparation activities. All of the newly installed wells were developed and the existing wells were purged prior to the collection of an initial round of groundwater sample collection. A network of 16 wells exists to monitor groundwater contamination, in accordance with the ROD. CDM Smith conducted post-construction monitoring through a separate contract.

After the initial three-year monitoring period called for in the ROD, groundwater contaminant concentrations appeared to be decreasing; however, they still exceeded the cleanup goals in two of 16 monitoring wells. Following the three-year monitoring period, EPA determined that bi-annual monitoring should be conducted in eight monitoring wells for two additional years to further evaluate contaminant concentration trends. During this extended monitoring period, concentrations of chromium and nickel remained slightly above remediation goals in only two wells: MW-03(R)S and MW-11S. The most-recent sampling event conducted by EPA's Environmental Response Team in March 2016 showed that those two locations still exhibited slightly elevated concentrations. Groundwater monitoring will continue on an annual basis until the cleanup goals are achieved.

Institutional controls in the form of a CEA were not considered necessary because of limited access and a lack of redevelopment plans for the site as dictated by the ROD. This continues to be the case and it is not expected that a CEA will be needed due to the downward trend of contaminant concentrations in the groundwater.

Wetland

After completion of restoration activities, an initial wetland restoration inspection was conducted on May 6, 2008. The final restoration inspection was then held on October 15, 2009 after a one-year maintenance period. CDM then monitored the wetlands twice a year until October 2009 and then once in 2010 and 2013. Monitoring was done in accordance with the Upland and Wetland Areas Restoration Work Plan (USACE 2008). Wetland monitoring measured restoration performance including hydrology criteria, vegetation diversity and soil characteristics. Five monitoring stations were established throughout the wetland. The final monitoring event, completed in June 2016 by EPA's Emergency Response Team (ERT), concluded that restoration efforts had met project success goals and that no further monitoring was required.

III. DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE AND QUALITY CONTROL

A Quality Assurance and Quality Control (QA/QC) program was used in the development of the remedial design and throughout the remedial action. All necessary sampling and testing results indicate that the work was properly implemented to the degree needed to assure satisfactory execution of the remedial action consistent with the ROD.

The performance standards and construction quality control for EPA's activities were performed in accordance with all the site-specific plans and any other applicable regulations. In addition, disposal activities complied with all transportation and disposal requirements.

The QA/QC program used throughout the construction was rigorous and in conformance with EPA standards; therefore, EPA determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the remedial actions, and further are consistent with the ROD and RD plans and specifications, as modified by the as-built documentation.

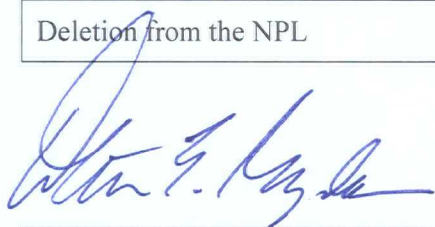
IV. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

Because the Site Remedy will not result in hazardous substances, pollutants, or contaminants remaining above levels that allow for unlimited use and unrestricted exposure, a five-year review will not be required for the Site.

However, because it may take more than five years to attain remedial action objectives and cleanup levels for the Site groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

The following activities remain for the Site:

Table 1: Schedule of Activities to Complete Site		
Task	Estimated Completion	Responsible Organization
Final Groundwater Monitoring	To be determined	EPA
Five-Year Review	To be determined	EPA
Approve Final Close Out Report	To be determined	EPA
Deletion from the NPL	To be determined	EPA



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Date

Table 2: 2004 ROD Surface Soil, Subsurface Soil, Sediment and Groundwater Cleanup Criteria

Compound	ROD Surface Soil Cleanup Criteria (ppm)	ROD Subsurface Soil Cleanup Criteria (ppm)	ROD Sediment Cleanup Criteria (ppm)	ROD Groundwater Cleanup Criteria (ppm)
Chromium	32	500	430	100
Copper	50	500	320	
Nickel	20	20	230	100
Silver	2	20	20	

Source: Tables 11, EPA Superfund Record of Decision: Zschiegner Refining Company Superfund Site, Howell Township, Monmouth County, New Jersey, September 2004